Running on Empty:

Nutritional Access for Children in Cook County, IL

APPENDICES A & B

Full study available at www.heartlandalliance.org/research

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Prepared by the Social IMPACT Research Center for the Greater Chicago Food Depository

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GREATER CHICAGO FOOD DEPOSITORY

Appendix A: Methodology

With its diverse programming, including child-centered programs and advocacy efforts, the Greater Chicago Food Depository is working to address child hunger in its service area of Cook County, Illinois. In an effort to make informed program expansion and improvement decisions, the Greater Chicago Food Depository commissioned the Social IMPACT Research Center of Heartland Alliance to conduct a study of child nutrition program coverage and child nutrition and hunger in Cook County.

In particular, this study examines the geographic spread of existing nutrition programs serving children in light of need for food programs. Since mitigating the effects of food insecurity and hunger require not simply providing food to people in need, but increasing access to *nutritious* food, this study also examines in detail the nutritional lives of children participating in the federally-funded Summer Food Service Program to illuminate opportunities where child nutrition programs can be strengthened. Together these analyses highlight where nutrition programs can serve more children in need and how nutrition programs can serve children better. The core research questions are as follows:

1. How does the geographic spread of economic need match up with the current landscape of food program delivery to school-age children in Cook County?
    a. Where are the programs that serve children located?
    b. What Chicago community areas and municipalities are least served?

2. What are the gaps in Cook County children's nutritional lives?
    a. What do children eat in an average day?
    b. What time during the day are children lacking food?
    c. Where/how are children getting food?
    d. What levels of food insecurity are experienced by children?

This study involved two phases. Phase I sought to answer research question one, and Phase II sought to answer research question two. Phase I involved the use of existing program and economic data to determine geographic gaps in food program coverage in Cook County for children ages 5 to 17, while Phase II involved original data collection from children ages 7 to 17 in out-of-school programs across Cook County. This study was approved by the Research Review Committee at Heartland Alliance for Human Needs & Human Rights and by the Research Review Committee at Chicago Public Schools, where two sample sites were located.

Phase I: Unserved Children & Program Coverage

In Phase I existing data were used to uncover food program coverage in light of food need for school-age children ages 5 to 17. This phase involved gathering data on child nutrition programs to determine where they were located and how many children they serve and developing estimates of how many children could benefit from nutrition programs.

The data on child nutrition programs in Cook County came from a data request submitted under the Freedom of Information Act to the Illinois State Board of Education. Data for following programs were requested:

- National School Lunch Program, NSLP (September 2009 data)
- Afterschool Care Program, ACP (September 2009 data)
- School Breakfast Program, SBP (September 2009 data)
- Summer Food Service Program, SFSP (July 2009 data)
- Seamless Summer Option, SSO (July 2009 data)
- Child and Adult Care Food Program, CACFP (September 2009 data)

Data for the months of July and September 2009 were requested a) to reflect the summer month (July) most likely to have summer programs in full operation (many programs begin later in June and end in mid-August); and b) to reflect the most recent possible month (September) for which school year program data were available.

At a minimum, for each program and participating site, the following data were requested:

- Street address of each site
- Number of meals served
- Type of meal served (breakfast, lunch, supper, or snacks)
- Days of operation
- Number of days operating that month
- Average daily participation

Establishing Need

Since no data exist that directly estimate the number of children who need nutritional programming, a proxy was developed. For the purposes of this analysis, "need" was defined as eligibility for free and reduced-price school lunches through the National School Lunch Program. School children are eligible for free and reduced-price lunches if their family's income falls below 130 percent of the federal poverty line (to be eligible to receive meals for free) or 185 percent of the federal poverty line (to be eligible to receive meals at a reduced rate).

The advantage of using this data as a proxy for need is that it is very current information (September 2009) and is geographically detailed (by address of the attended school). The disadvantage is that need is attributed to school census tracts, not the children's home census tracts, though if they travel any distance to school regularly, they may presumably also travel for out-of-school programming or attend programming near school instead of home. Data were then aggregated to Chicago community areas and Suburban Cook County municipal levels.

Total number of school-age children that meet this study's definition of need are listed in Tables 1 and 2.

Table 1. Need by Chicago Community Area

Chicago community area	*Number of children in need*	*Chicago community area*	*Number of children in need*
Albany Park	6,286	Lincoln Square	3,480
Archer Heights	5,051	Logan Square	8,369
Armour Square	1,247	Loop	1,184
Ashburn	7,219	Lower West Side	8,325
Auburn Gresham	6,741	McKinley Park	1,841
Austin	13,228	Montclare	1,196
Avalon Park	3,362	Morgan Park	2,689
Avondale	3,125	Mount Greenwood	732
Belmont Cragin	13,967	Near North Side	1,834
Beverly	755	Near South Side	1,012
Bridgeport	2,953	Near West Side	11,588
Brighton Park	9,926	New City	9,978
Burnside	581	North Center	3,928
Calumet Heights	1,483	North Lawndale	8,978
Chatham	4,417	North Park	3,386
Chicago Lawn	7,664	Norwood Park	2,658
Clearing	1,634	Oakland	525
Douglas	8,585	O'Hare	514
Dunning	2,587	Portage Park	6,670
East Garfield Park	6,969	Pullman	2,056
East Side	4,920	Riverdale	993
Edgewater	4,299	Rogers Park	4,606
Edison Park	119	Roseland	7,767
Englewood	8,797	South Chicago	5,310
Forest Glen	282	South Deering	1,987
Fuller Park	558	South Lawndale	15,623
Gage Park	10,066	South Shore	5,176
Garfield Ridge	3,633	Uptown	4,382
Grand Boulevard	4,352	Washington Heights	6,731
Greater Grand Crossing	5,259	Washington Park	3,553
Hegewisch	1,426	West Elsdon	3,972
Hermosa	4,596	West Englewood	7,044
Humboldt Park	9,901	West Garfield Park	3,331
Hyde Park	1,227	West Lawn	4,179
Irving Park	7,408	West Pullman	4,062
Jefferson Park	1,043	West Ridge	6,794
Kenwood	3,809	West Town	11,908
Lake View	4,056	Woodlawn	4,768
Lincoln Park	2,301	**Total**	**368,961**

Table 2. Need by Suburban Cook County Municipality

Municipality	*Number of children in need*	*Municipality*	*Number of children in need*
Alsip	696	Markham	1,490
Arlington Heights	1,119	Matteson	2,033
Bartlett	1,501	Maywood	3,785
Bedford Park	146	Melrose Park	3,572
Bellwood	2,337	Midlothian	1,209
Berkeley	638	Morton Grove	618
Berwyn	7,299	Mt. Prospect	1,946
Blue Island	3,820	Niles	1,011
Bridgeview	658	Norridge	298
Broadview	611	North Riverside	132
Brookfield	521	Northbrook	19
Buffalo Grove	843	Northfield	3
Burbank	1,868	Northlake	2,641
Burnham	186	Oak Forest	1,186
Burr Ridge	25	Oak Lawn	2,698
Calumet City	6,039	Oak Park	1,956
Calumet Park	904	Olympia Fields	1,389
Chicago Heights	6,427	Orland Hills	12
Chicago Ridge	677	Orland Park	66
Cicero	16,777	Palatine	4,227
Country Club Hills	1,206	Palos Heights	973
Countryside	111	Palos Hills	227
Crestwood	657	Palos Park	113
Des Plaines	3,131	Park Forest	2,838
Dixmoor	1,019	Park Ridge	10
Dolton	3,240	Phoenix	410
East Hazel Crest	0	Posen	840
Elk Grove Village	1,706	Prospect Heights	9
Elmwood Park	1,183	Richton Park	1,533
Evanston	3,833	River Grove	571
Evergreen Park	711	Riverdale	1,305
Flossmoor	526	Riverside	148
Ford Heights	540	Robbins	870
Forest Park	648	Rolling Meadows	1,285
Franklin Park	1,143	Rosemont	65
Glenview	930	Sauk Village	1,422
Glenwood	969	Schaumburg	587
Hanover Park	1,789	Schiller Park	826
Harvey	4,897	Skokie	1,834
Harwood Heights	147	South Chicago Heights	477
Hazel Crest	1,605	South Holland	3,234
Hickory Hills	611	Steger	805
Hillside	1,656	Stickney	216
Hodgkins	138	Stone Park	80
Hoffman Estates	1,894	Streamwood	3,958
Hometown	222	Summit	1,264
Homewood	687	Summit Argo	881
Inverness	4	Tinley Park	655
Justice	1,185	University Park	0
La Grange	252	Westchester	161
La Grange Park	356	Wheeling	2,699
Lansing	3,197	Willow Springs	150
Lemont	131	Wilmette	4
Lynwood	314	Worth	0
Lyons	931	**Total**	**155,758**

Cleaning the Data Sets

For each program, sites were geocoded using a GIS program to assign each site to its respective census tract and community area (for Chicago) or municipality (for Suburban Cook County). Some anomalies surfaced during this geocoding process:

- A small number of sites sit on or very near the border of Chicago. These few sites have Chicago addresses, but their corresponding census tract does not place them neatly within a Chicago community area. These sites were treated as part of the overall numbers in the municipality files but were not attributed to a specific community area in the community area files.
- There were a number of sites that were listed as being enrolled in a specific program but had no claim data (no meals served) in that month. Such sites were included in total site counts since at any point in the future it is likely that many will serve meals.
- There were three municipalities – East Hazel Crest, University Park, and Worth – that had CACFP sites but did not file for free and reduced-price school lunches, so no children met the established definition of need. (Municipalities that had no need data do not necessarily have no children in families with incomes below 185 percent of the poverty level. Some schools and districts choose not to participate in the National School Lunch Program and so no data on this measure are reported.) Program data from these three municipalities are included in aggregate numbers of sites and meals, but these three municipalities are excluded from rankings and discussions of municipalities with and without sites and various meals.
- Eleven Suburban Cook County municipalities, the bottom 10 percent, had 80 or fewer children in need. These municipalities were also excluded from the discussions of number of municipalities with and without sites and various meals since program expansions are more likely to occur in areas with higher numbers of children in need.
- This analysis includes only Child and Adult Care Food Program sites designated as facilities (centers), because data for the daycare homes are not available by site location. Since need for this analysis is defined as *school-age* children eligible for free and reduced-price lunches and because the CACFP sites likely serve younger children, excluding the daycare homes portion of the program likely only slightly understates program coverage for school-age children. This probable slight understatement is likely offset by the fact that sites that are included (centers) likely overstate program coverage for the same reason – many of them serve children who are not yet school age.
- The CACFP data reflected September 2009, but since the program also operates in the summer months, we included all non-SFSP and non-SSO CACFP sites in the "Summer Programs" aggregate analysis.
- In addition to serving meals at free and reduced-price costs, many of these programs also serve paid meals. For the purposes of this analysis *only* free and reduced-price meals were counted since they are most specifically targeted to the need population.
- "Total meals served in month" and "average number of meals served a day" for any given program includes an aggregate count of each individual meal served in a

program (snacks were considered meals for the purposes of this analysis). For instance, the Summer Food Service Program serves breakfast, morning snacks, lunch, afternoon snacks, and supper and so each of those meals are counted in the total meals and average meals figures. For programs were the meal served is the only meal served (e.g., the School Breakfast Program only serves breakfast) the "total meals served in the month" matches that particular meal count ('Breakfast meals served", in the SBP example).

- Additionally, since data are not specific, snacks for the Seamless Summer Option and the Afterschool Care Program were attributed to the afternoon snack meals category. Similarly, snacks and suppers served through the CACFP's At-Risk After-School Snack /Supper Program were counted in the afternoon snack and supper categories.

Comparing Need to Program Data

The level of need in any given community area and municipality was then matched with the number of children served by a program. This involved determining the number of children served in each program for each meal on an average day (using number of meals as a proxy for number of children) and subtracting the resulting figure from the number of children in need. Geographies were then ranked for each program on each meal type and composite rankings (an average of all individual rankings) developed for summer programs together and school year programs together, to identify areas that have the *highest number of unserved children*.

Additionally, the level of need in a community area and municipality was matched with food program coverage measures (number of total sites; number of meals served on an average day; number of total meals served during the month; total number each of early snacks, breakfast meals, morning snacks, lunch meals, afternoon snacks, supper meals, and evening snacks served during the month; number of Saturday sites; and number of Sunday sites) for each child nutrition program in each community area and municipality to develop a series of ratios. Each program included in the analysis is slightly different and so different ratios were developed for each program based on its unique offering of meals and snacks. Importantly, two sets of composite ratios were developed, one for all programs operating in the summer and the other for all programs operating during the school year. Community areas and municipalities were then ranked from the least favorable ratio to the most favorable on the various aggregated program components and the average of these ratios taken to identify the areas that have the *worst overall program coverage*.

Phase II: The Nutritional Lives of Children

Phase II consisted of a quantitative research approach with survey tools administered to children in out-of-school programs. Out-of-school programs meet outside of school hours at schools, parks, churches, community centers, or other places, and generally combine a mix of academic, recreational, or cultural activities for children and youth.

This study engaged children as the research participants. "In most of the western world it is now recognized that children have a voice that should be heard and there is a new demand for research that focuses on children as actors in their own right."[1] Children were engaged in this study and not their parents to determine how a *child* perceives his or her food intake since it is the *child's* hunger being studied. Additionally, studies have shown in regards to health-related inquiries, parents tend to overstate favorable responses.

The study was specifically focused on children ages 7 to 17. Studies that have explored children's recall and children's ability to accurately answer survey questions have revealed that it is difficult to obtain accurate and usable data from children younger than age 7.[2] [3] [4]

Survey Instrument Development

To measure children's food intake and food insecurity/hunger, two data collection instruments were used: the 24-Hour Food Recall and the Child Food Security Survey Module. These existing instruments were modified to fit the unique needs of this study. Existing survey instruments have the advantage of being already tested and shown effective for use with children and have been tested for validity and reliability, two important measures of how accurately the instrument measures what it is intending to measure and how consistently it does so.

The survey instruments for the 7 to 12 year olds were administered by a field worker in a 15 to 20 minute one-on-one structured interview. The 13 to 17 year olds were given the option of working one-on-one with a field worker or self-administering the instruments in a group of three guided by a field worker.

The 24-Hour Food Recall

While there are several developed instruments that are used to measure the food intake of children, prior research recommends the use of the 24-Hour Food Recall to collect the most accurate picture of usual food intake of a given population, specifically children. The 24-Hour Food Recall involved children self-reporting food consumption for the prior 24-hour period. For each food item a child consumed in the last 24 hours, they were also asked to recall the characteristics of that food (e.g., what they put on it, whether it was fresh or canned, if it was wheat or white bread, and so on), what time of day the food

was consumed, where they got the food (e.g., home, out-of-school program, the corner store), and how much of the food they consumed.

The self-reporting structure of the instrument allows for its use with broad populations and ethnicities and the respondent burden is relatively small.[5] While the 24-Hour Recall may not be an adequate measure of individual intake, it is appropriate for measuring group intake.[6] In addition, the ability to conduct one-on-one interviews with younger children (7-12 years old) and ask probing questions helps to limit the prevalence of inaccuracies in reporting.

The appropriateness of the 24-Hour Recall for this study was determined by comparing its feasibility with several additional food intake reporting methods. Food frequency questionnaires, which attempt to estimate food intake over longer periods of time (mostly last month(s) or year), have not been proven valid and reliable for use with children under 12, largely due to young children's lack of comprehension around concepts such as "average" and "usually." The longer recall periods and lack of probing capabilities also contribute to increased inaccuracies in reporting due to poor intake estimations and portion size recall.[7] A food frequency questionnaire is a useful tool when estimating food intake on an individual level and for older children. A food inventory is the most accurate representation of actual individual food intake as it requires participants to keep a written account of food consumed in a period of 3 to 7 days. The in-depth nature of food inventories do not lend themselves to feasibly be applied to child populations.

The Child Food Security Survey Module

The Child Food Security Survey Module (CFSSM) was developed by Connell, Nord, Lofton, and Yadrick (2004), and is derived from the U.S. Department of Agriculture's household Food Security Survey Module which elicits food security and nutritional intake information from adults within the household. The CFSSM is a nine question instrument with three response choices for each item that asks *children* to consider their food experiences in the last month. For instance, a question asks, "In the last month, did the food that your family bought **run out** and you didn't have money to get more?" Children that respond with one of the two affirmative response choices (A lot or Sometimes) to any given statement on the CFSSM are given a point for that question, while the negative response category (Never) gets no point, for a total of 9 possible points. Children who score 0 to 1 are considered food secure. A score of 2 to 5 is considered food insecure without hunger, and a score of 6 to 9 is considered food insecure with hunger.[8]

Sampling

Data collection occurred onsite at 19 out-of-school summer programs (Map 1). Seventeen of the 19 sample sites were in Chicago and the remaining 2 sites were in South Suburban Cook County. Thirteen sites were participating in the Food Depository's Kids Cafes program, and the remaining six were Boys and Girls Clubs of Chicago sites. All sites were participating in the USDA's Summer Food Service Program. These two sets of sites were

chosen not to compare but rather to ensure a good mix of program sizes, geographic coverage, and more than one sponsor, but not too many so as to greatly increase the administrative burden of implementing the study.

- Kids Cafe sites were eligible for inclusion in the study if they a) had summer operation (43 sites did), and b) began summer operation at least 2 weeks before the week of data collection (33 sites did) to allow adequate time for the parental consent process. The 13 Kids Cafes (30 percent of all summer-operating Kids Cafes) that ended up in the study were chosen to ensure a good mix of program size and location and based on administrative cooperation.
- Boys and Girls Clubs of Chicago (BGCC) sites were eligible for inclusion in the study of they had summer operation (8 sites did). The 6 sites in the study (75 percent of all summer operating BGCCs) displayed administrative cooperation and no barriers during the week of data collection (e.g., field trips).

Greater Chicago Food Depository Kids Cafes and Boys and Girls Clubs of Chicago

The Greater Chicago Food Depository utilizes a combination of federally-funded programs and private dollars to support its child-centered programming. Beginning in 1993, the Greater Chicago Food Depository partnered with established youth programs to provide hot meals and educational programs for children. Sites receiving Food Depository meals are called Kids Cafes, a national initiative of Feeding America. In order to become a Kids Cafe programs must meet certain criteria, including that they must:1) be an out-of-school program managed by a 501(c)3 organization that offers children educational activities, 2) be located in an area where the nearest school has at least 50 percent of their students qualifying for free or reduced-price lunches, 3) not have participation fees that would make the site inaccessible to low-income children, and 4) incorporate a minimum of four monthly nutrition education activities.

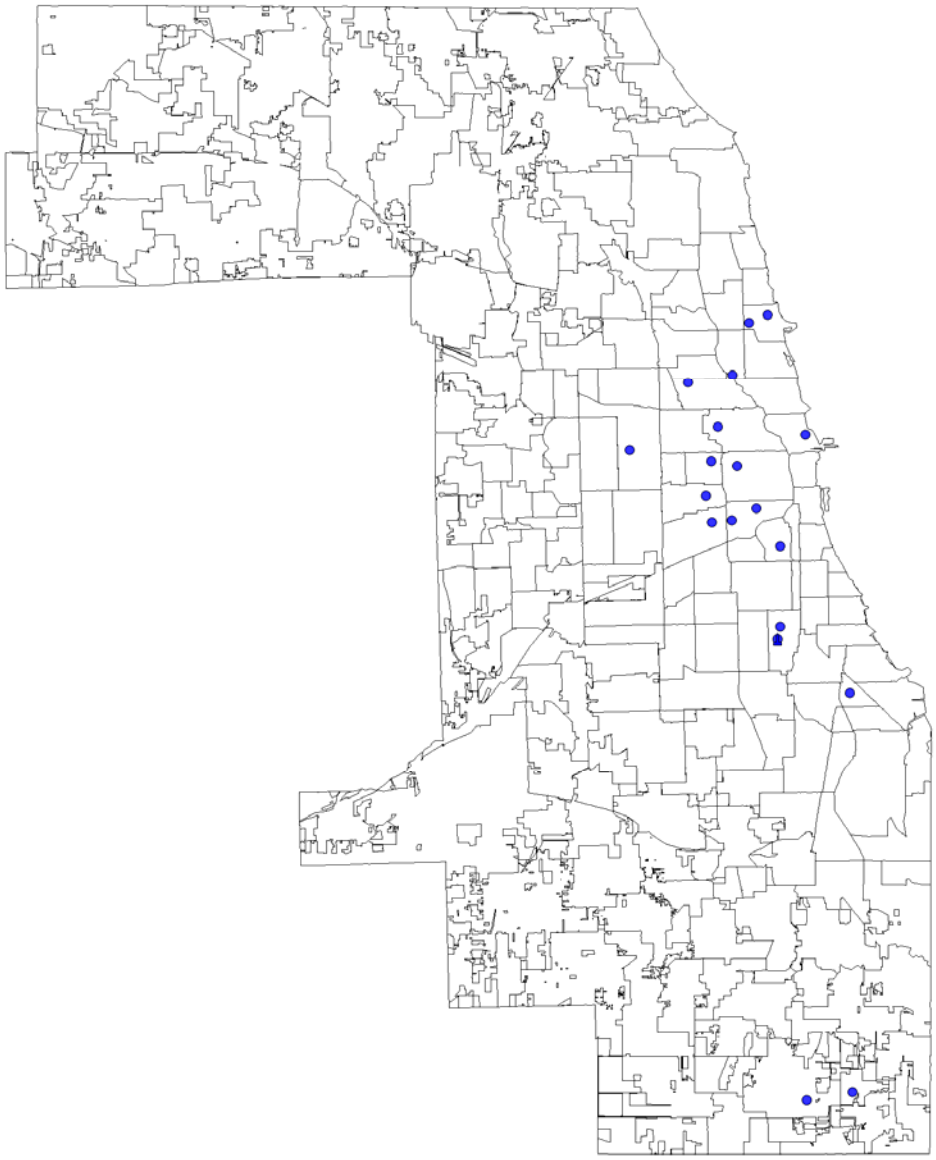
The Food Depository offers both a hot and a cold meal option to its Kids Cafes. The hot meals are prepared by students in Chicago's Community Kitchens, the Food Depository's foodservice training program for unemployed and underemployed adults. In the 2009-2010 school year there were 55 Kids Cafe sites, serving 3,000 children, operating throughout Cook County communities and Chicago neighborhoods. There were 43 Kids Cafes in operation in the summer of 2009 serving 2,300 children on any given day.

The Boys and Girls Club of Chicago (BGCC) provides services to youth throughout Chicago. They offer after-school programming at 32 clubs centered around sports, recreation, healthy living, education, career exploration, and appreciation of the arts. They also offer full-day summer programming, where they provide meals through the SFSP. BGCC has a membership fee of $20, and any child ages 5 to 18 can join. Across Chicago there are over 15,000 members.

The convenience sample of children ages 7 to 17 came from the 19 study sample sites. During the week of June 22-26, 2009, all children attending the sample site out-of-school programs were sent home with a study flyer and consent form, which they were asked to share with their parents and return. The consent form included the following information: purpose, procedures, potential risks and discomforts, anticipated benefits to

subjects, anticipated benefits to society, privacy and confidentiality, and details on participation and withdrawal.

Map 1. Nineteen Sample Sites Throughout Cook County, Illinois



In return for the child having consent to participate in the study, parents/guardians were mailed a $10 gift card to a Chicago area grocery store, whether or not the child later assented to participate. A $10 incentive for parents was deemed enough to provide minimal compensation for allowing their child to take the survey but not too much so as to be coercive. Sending the gift card directly to the parents ensured that a) the parent/guardian received it, and b) parents did not pressure their children to give assent so they could get the gift card.

After informed consent was documented, each eligible child was given the opportunity through an assent process to decide for him or herself whether to participate. Though children cannot legally give consent, researchers can gain assent (affirmative agreement) from children to participate. Usually, children age 7 and above have the ability to understand a simple assent form, adjusted for their developmental stage, to agree to participate in a research project. To obtain assent from the children eligible for inclusion in this study, field workers:

- Verbally described the study to each study participant in age-appropriate lay language that covered the study purpose and procedures as well as the length of time of the survey/interview.
- Read the assent form aloud to each eligible child. Through this reading, each eligible child was informed…
  - Of the potential risks and benefits of participation in the study.
  - That they can decide whether or not they want to participate in an interview/survey (that participation is voluntary).
  - That they can end (withdraw from) the interview/survey at any time.
  - That their decision to participate or not in the interview/survey will in no way affect the services they receive at that program site or any other.
  - That all of their information will be kept confidential and nothing will identify them personally.
  - That they can skip any questions in the interview/survey if they don't want to answer it.
  - That they do not have to be in the study even if their parent agreed to have them participate.
- Asked probing questions to ensure the participants understand the assent form.
- Gave each eligible child the opportunity to ask questions about the study and follow-up contact information should they have questions at a later time.
- Asked study participants to assent orally and then sign or print their name on the assent form, indicating willingness to participate in the proposed research study. Children ages 7 to 9 usually printed their name, and older children signed their name.

If assent was refused, the eligible child was not enrolled in the study. Whether or not the eligible children assented to participate in the study, they received a granola bar in appreciation of their time.

Data Collection

The survey field teams consisted of Social IMPACT Research Center staff as well as 35 trained volunteers and Food Depository staff. Most volunteers were already engaged in some capacity with the Food Depository and others were recruited through various channels including area social work schools, online volunteer matching sites, and word of mouth. Staff and volunteers were then trained as field workers by the study team. The

training lasted 2 hours and covered logistics, the assent process, administering the data collection instruments, discussion of ethical and human subjects protections protocols, and practice. No representatives of the Food Depository were assigned to survey children at sites where they normally work.

All data collection occurred during the week of July 6-10, 2009. IMPACT distributed survey field teams based on the expected daily attendance at each sampled site and the volume of returned consent forms. A flyer, a blank copy of the assent form, and a copy of the survey instruments were sent home with children who participated to let their parents know.

Risk and Confidentiality/Privacy

This study posed no or minimal risk to the participants. Minimal risk is defined in the Federal Register as "the probability and magnitude of harm or discomfort anticipated in the research are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests." Some examples might include: the study subject experiences no pain or physical danger; the study subject experiences no emotional arousal or psychological stress beyond the levels normally to be expected in everyday life; or the data would not embarrass or socially disadvantage the study participant, were confidentiality to be violated.

In this study, no personal identifiable information was collected and no or minimal harm was done to children by asking questions about what they had eaten recently. The questions were asked in a non-judgmental, non-threatening manner.

The paper copies of all of the data collection tools were stored in locked filing cabinets accessible only to the research team. The cabinets are in a facility that is alarm secured after office hours. Each respondent was assigned a unique identifier. The data were entered into the computer using that unique identifier. The computer files were password protected. Forms and computer files will be destroyed five years after project completion.

Appendix B: Data Entry Process

The second phase of this study analyzed the nutritional lives of children using a 24-Hour Food Recall. In the 24-Hour Food Recall, children were asked to itentify all food items they consumed in the last day. For each identified food item, they were also asked to:

- document the characteristics of that item (did they put anything on it, like butter or ketchup; was it frozen, fresh, or canned; was it skim, 1%, or 2%; and so on)
- identify the time of day they ate it (with the choices of breakfast, morning snack, lunch, afternoon snack, dinner, or after dinner snack)
- identify the location the food originated from (as opposed to where it was consumed)
- specify how much of the food item they consumed (field workers had visuals and props to help the children identify serving size)

In order to translate the children's responses into a data set from which coherent findings emerge and comparisons can be made across responses, all the collected data went through a vetting process and a variety of inferences were made and labels assigned. Each food item identified by the respondent was entered into statistical software as that particular food item. It was then assigned up to three food types. The amount that the child consumed of each food item was translated into serving sizes. In order to remain consistent in both categorizing and determining serving sizes for different foods, one researcher entered all reported data.

Food Items

A food item is the actual *food* identified by the respondent and recorded by the child or field worker on the 24-Hour Food Recall data collection instrument. Examples include tacos, juice, flaming hot chips, or apple.

Food Type

Each food item a child reported eating was then tagged by food type. Any given food item could receive up to three different type designations. For instance, fried chicken is typed as both a protein and a fried food. Assumptions and categorization of answers from surveys were based on the United States Department of Agriculture (USDA) Dietary Guidelines found at MyPyramid.gov (see below). Food groups from the Pyramid include grains, vegetables, fruits, dairy, protein, and oils. For the purposes of this study, and to add an additional layer of detail, the categories of junk food, fried food, water, pop/other drinks (not juice) were added.

Examples from the survey that fell into the aforementioned categories vary greatly. Food items reported in surveys that fall into the grain category include bread, cereal, oatmeal, graham crackers, granola bars, rice, and tortillas. Vegetables included lettuce, mixed vegetables, tomatoes, and salad. Examples of fruits are apples, orange juice, cherry apple juice, and bananas. Dairy was often reported as processed cheese, milk, and milk on cereal. Proteins include anything from peanut butter to hot dogs or bologna. Oils were recorded when children report putting butter or oil on food. Other fatty foods such as candy, cookies, and chips were categorized as junk food, and french fries, fried chicken, or other fried foods were typed as fried food.

Answers from the surveys often fell into a number of categories. For example, a respondent may have eaten a ham and cheese sandwich for lunch. This single food fell into three categories. One sandwich is assumed to have two slices of bread, which counts as two servings from the grain food group, according to the USDA. The sandwich is also assumed to contain about one ounce of ham, which is one serving from the protein food group, and about one ounce of processed cheese, which is one half of a serving of dairy.

Foods may also have been given multiple codes because of the way they were cooked. Breaded fried meats, such as fried chicken, chicken nuggets, or fish sticks, were categorized as both a serving of protein and a serving of fried junk food.

Serving Size

Children and field workers recorded the amount of food consumed by using visuals and props - differently sized measuring cups and a poster with a variety of differently sized shapes. They documented the amount of food consumed by writing things like "1 cup" or "2 small slices" or "Half a banana." Serving sizes were interpreted from these reported amounts.

Number of servings and serving sizes recorded were also based on the Dietary guidelines from the USDA. In the USDA guidelines, servings of proteins are measured in ounces, so one ounce of meat is equivalent to one serving. Dairy and grains can be measured in ounces or cups, depending on the food. Fruit and vegetables are generally measured in cups. Number of recommended servings varies by age and in some instances gender, so recommended daily intake amounts were averaged across gender and age breakdowns to establish a threshold for this study. The averaged amounts used for this study are as follows:

Grains	6 servings
Proteins	5 servings
Dairy	3 servings
Vegetables	2 servings
Fruits	1.5 servings

Grains: USDA Recommended Daily Allowance and Translation for This Study
The USDA states: "In general, 1 slice of bread, 1 cup of ready-to-eat cereal, or ½ cup of cooked rice, cooked pasta, or cooked cereal can be considered as 1 ounce equivalent from the grains group."[9]

For the purposes of this study, the assumption was made that one ounce is equivalent to one serving, and on average, the children in this study need a minimum of 6 servings to meet the daily recommendation of grains.

Table 3. Grain Recommended Daily Allowances

	Age	*Daily Recommendation*	*Daily minimum amount of whole grains*
Children	2-3 years old	3 ounce equivalents	1 ½ ounce equivalents
	4-8 years old	4-5 ounce equivalents	2-2 ½ ounce equivalents
Girls	9-13 years old	5 ounce equivalents	3 ounce equivalents
	14-18 years old	6 ounce equivalents	3 ounce equivalents
Boys	9-13 years old	6 ounce equivalents	3 ounce equivalents
	14-18 years old	7 ounce equivalents	3 ½ ounce equivalents

Protein: USDA Recommended Daily Allowance and Translation for This Study
The USDA states: "In general, 1 ounce of meat, poultry or fish, ¼ cup cooked dry beans, 1 egg, 1 tablespoon of peanut butter, or ½ ounce of nuts or seeds can be considered as 1 ounce equivalent from the protein group."[10]

For the purposes of this study, the assumption was made that one ounce is equivalent to one serving, and on average, the children in this study need a minimum of 5 servings to meet the daily recommendation of protein.

Table 4. Protein Recommended Daily Allowances

	Age	*Daily Recommendation*
Children	2-3 years old	2 ounce equivalents
	4-8 years old	3-4 ounce equivalents
Girls	9-13 years old	5 ounce equivalents
	14-18 years old	5 ounce equivalents
Boys	9-13 years old	5 ounce equivalents
	14-18 years old	6 ounce equivalents

Dairy: USDA Recommended Daily Allowance and Translation for This Study
The USDA states: "In general, 1 cup of milk or yogurt, 1 ½ ounces of natural cheese, or 2 ounces of processed cheese can be considered as 1 cup from the milk group."[11]

For the purposes of this study, the assumption was made that one cup is equivalent to one serving, and on average, the children in this study need a minimum of 3 servings to meet the daily recommendation of dairy.

Table 5. Dairy Recommended Daily Allowances

	Age	*Daily Recommendation*
Children	2-3 years old	2 cups
	4-8 years old	2 cups
Girls	9-13 years old	3 cups
	14-18 years old	3 cups
Boys	9-13 years old	3 cups
	14-18 years old	3 cups

Vegetable: USDA Recommended Daily Allowance and Translation for This Study
The USDA states: "In general, 1 cup of raw or cooked vegetables or vegetable juice, or 2 cups of raw leafy greens can be considered as 1 cup from the vegetable group."[12]

For the purposes of this study, the assumption was made that one cup is equivalent to one serving and, on average, the children in this study need a minimum of 2 servings to meet the daily recommendation of vegetables.

Table 6. Vegetable Recommended Daily Allowances

	Age	*Daily Recommendation*
Children	2-3 years old	1 cup
	4-8 years old	1 ½ cups
Girls	9-13 years old	2 cups
	14-18 years old	2 ½ cups
Boys	9-13 years old	2 ½ cups
	14-18 years old	3 cups

Fruit: USDA Recommended Daily Allowance and Translation for This Study
The USDA states: "In general, 1 cup of fruit or 100% fruit juice, or ½ cup of dried fruit can be considered as 1 cup from the fruit group. The following specific amounts count as 1 cup of fruit (in some cases equivalents for ½ cup are also shown) towards your daily recommended intake:"[13]

For the purposes of this study, the assumption was made that one cup is equivalent to one serving, and on average, the children in this study need a minimum of 1.5 servings to meet the daily recommendation of fruit.

Table 7. Fruit Recommended Daily Allowances

	Age	*Daily Recommendation*
Children	2-3 years old	1 cup
	4-8 years old	1 ½ cups
Girls	9-13 years old	1 ½ cups
	14-18 years old	1 ½ cups
Boys	9-13 years old	1 ½ cups
	14-18 years old	2 cups

Fats & Oils: USDA Recommended Daily Allowance and Translation for This Study
The USDA states: "While consuming some oil is needed for health, oils still contain calories. In fact, oils and solid fats both contain about 120 calories per tablespoon.

Therefore, the amount of oil consumed needs to be limited to balance total calorie intake. The Nutrition Facts label provides information to help you make smart choices."[14] And "Most Americans consume enough oil in the foods they eat, such as: Nuts, fish, cooking oil, and salad dressings. A person's allowance for oils depends on age, sex, and level of physical activity."[15]

Table 8. Fats & Oils Recommended Daily Allowances

	Age	*Daily Recommendation*
Children	2-3 years old	3 teaspoons
	4-8 years old	4 teaspoons
Girls	9-13 years old	5 teaspoons
	14-18 years old	5 teaspoons
Boys	9-13 years old	5 teaspoons
	14-18 years old	6 teaspoons

For the purposes of this study, servings of oil were recorded when children report adding butter or oil to foods. Other fatty foods are generally classified as "junk food."

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